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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,179	10/30/2003	Thomas W. Kenny	COOL-01302	2504
28960	7590	03/23/2006		
HAVERSTOCK & OWENS LLP 162 NORTH WOLFE ROAD SUNNYVALE, CA 94086			EXAMINER MCKINNON, TERRELL L	
			ART UNIT	PAPER NUMBER
			3753	
DATE MAILED: 03/23/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/698,179	Applicant(s) KENNY ET AL.	
	Examiner Terrell L. Mckinnon	Art Unit 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-127 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18-26, 28-40, 45-59, 61-69, 71-83 and 88-102 is/are rejected.
- 7) ☒ Claim(s) 17, 27, 41-44, 60, 70, 84-87, 103 and 124-127 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>all dates</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Applicant is advised to carefully review all claims for possible obvious double patenting with related patent applications and patents. Also Applicant is advised to review all claims for clarity with regards to the different layers and associated limitations for each layer.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7, 9, 11, 14, 45-50, 52, 54, 57, 88-94, 96, 98 and 100 are rejected under 35 U.S.C. 102(b) as being anticipated by Chu et al. (U.S. 5,269,372).

Chu discloses an intersecting flow network for a cold plate cooling system comprising all of the applicant's claimed and disclosed limitations of the instant invention.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8, 10, 12, 12, 15, 16, 18-23, 25, 26, 28-40, 45-59, 61-66, 68-69, 71-83, 88-102, 104-109 and 111-123 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. (U.S. 5,269,372) in view of Gruber et al. (U.S. 5,388,635).

Chu's invention discloses all of the claimed limitations from above except for wherein the at least one inlet and outlet port is positioned substantially parallel with respect to the plane; the fluid is transforms from a single phase to a two phase fluid flow; at least one of the plurality of pillars has an area dimension within the range of and including (10 micron)per square and (100 micron)per square; at least one of the plurality of pillars has a height dimension within the range of and including 50 microns and 2 millimeters; at least two of the plurality of pillars are separate from each other by a spacing dimension within the range of and including 10 to 150 microns; the heat exchanger layer is made of a porous structure with a porosity and pore size as claimed; microchannels disposed in the first layer with a dimension and height as claimed.

5. However, Gruber teaches the use of at least one inlet and outlet port is positioned substantially parallel with respect to the plane; the use of a single phase or a two phase fluid flow; a plurality of pillars (above element 120); at least one of the plurality of pillars has a height dimension; at least two of the plurality of pillars are separate from each other by a spacing dimension; the heat exchanger layer is made of a porous structure (16 and 18) with a porosity and pore size; microchannels disposed in the first layer with a dimension and height.

Given the teachings of Gruber, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the cold plate cooling system of Chu with at least one inlet and outlet port is positioned substantially parallel with respect to the plane; the fluid is transforms from a single phase to a two phase fluid flow (column 18, lines 21-48); at least one of the plurality of pillars has an area dimension within the range of and including (10 micron)per square and (100 micron)per square; at least one of the plurality of pillars has a height dimension within the range of and including 50 microns and 2 millimeters; at least two of the plurality of pillars are separate from each other by a spacing dimension within the range of and including 10 to 150 microns; the heat exchanger layer is made of a porous structure with a porosity and pore size as claimed; microchannels disposed in the first layer with a dimension and height as claimed.

Doing so would improve the thermal efficiency of the cooling system for cooling heat generated electronic devices.

6. Claims 24, 67 and 110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. (U.S. 5,269,372) in view of Gruber et al. (U.S. 5,388,635) as applied to claims above, and further in view of Cannell (U.S. 6,729,383).

Ikeda's invention discloses all of the claimed limitations from above except for wherein at least one of the plurality of pillars includes at least varying dimension along a predetermined direction.

7. However, Cannell teaches the use of a plurality of pillars having at least varying dimension along a predetermined direction.

Given the teachings of Cannel, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the cold plate cooling system of Ikeda with at least one of the plurality of pillars includes at least varying dimension along a predetermined direction.

Doing so would provide an increased surface area for enhancing heat transfer to the circulating fluid.

Allowable Subject Matter

Claims 17, 27, 41-44, 60, 70, 84-87, 103 and 124-127 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited for disclosing related limitations of the applicant's claimed and disclosed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L. Mckinnon whose telephone number is 571-272-4797. The examiner can normally be reached on Monday - Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Mancene can be reached on 571-272-4930. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L Mckinnon
Primary Examiner
Art Unit 3753
March 20, 2006